AMENDMENTS TO THE CLAIMS

This Listing of Claims will replace all prior versions, listing of claims in the specification.

LISTING OF CLAIMS:

Claim 1 (Currently amended) A constant temperature distilling process, comprising the steps of implementing a drain-to-vacuum process using a degassed liquid to set a constant temperature distillation unit for vacuum distillation, or a constant temperature distillation unit for vacuum cooling to an initial state thereof; and setting a vacuum distilling [[10]] temperature for said constant temperature distillation unit for a degassed solution therein to boil and evaporate at said set vacuum distilling temperature in said unit; such that an equilibrium thermal cycling between evaporation and condensation can be maintained throughout said constant temperature distillation unit, and evaporation heat and condensate produced in said constant temperature distilling process are recovered and collected, respectively; said constant temperature distillation unit for vacuum distillation including an evaporating vessel, and a liquid-gas interface provided in said evaporating vessel, into and out of which a hot circulating solution flows via corresponding conduits and control valves at a predetermined flow rate, and said hot circulating solution providing evaporation heat through a heat transfer at said liquid-gas interface to evaporate said degassed solution in said evaporating vessel;

PAGE 3/14 * RCVD AT 3/10/2006 7:23:46 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/4 * DNIS:2738300 * CSID:410 461 3067 * DURATION (mm-ss):03-10

vacuumizing said conduits, said evaporating vessel, and said condenser through which said degassed solution, said vapors, or said condensed liquid flows, through implementing said drain-to-vacuum process using said degassed liquid to set said constant temperature distillation unit for vacuum distillation to an initial state; sealing said conduits, said evaporating vessel, and said condenser; closing said flow regulating valve; filling said vacuumized evaporating vessel with said degassed solution to a predetermined liquid level; and finally, setting the vacuum distilling temperature for said evaporating vessel; wherein said vacuum distilling temperature being lower than temperatures of said degassed solution and said hot circulating solution flown into said evaporating vessel and said liquid-gas interface, respectively .

Claim 2 (Original) The constant temperature distilling process as claimed in claim 1, wherein said constant temperature distillation unit for vacuum cooling includes an evaporating vessel, into which constant-temperature degassed solution flows via corresponding conduits and control valves at a predetermined flow rate, said evaporating vessel being connected to a condenser via a condensing tube for vapors produced by said evaporating vessel to flow into said condenser; a flow regulating valve provided on said condensing tube at a predetermined position for controlling the flow rate of vapors discharged from said evaporating vessel when said evaporating vessel is under a saturated vapor pressure at said set vacuum

PAGE 4/14 * RCVD AT 3/10/2006 7:23:46 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/4 * DNIS:2738300 * CSID:410 461 3067 * DURATION (mm-ss):03-10

distilling temperature, and thereby maintaining said evaporating vessel at said desired saturated vapor pressure; a condenser, into and out of which hot circulating solution flows via corresponding conduits and control valves at a predetermined flow rate to absorb evaporation heat of vapors produced by said evaporating vessel and flown into said condenser, so that said hot circulating solution is heated to a higher temperature and said vapors are condensed into liquid, which is then discharged into and collected with a vacuum vessel; and a lower vessel and parts thereof being located below said evaporating vessel with a predetermined height difference existed between them for producing vacuums in said conduits, said evaporating vessel, and said condenser through which said degassed solution, said vapors, or said condensed liquid flows.

Claims 3 - 4 (Cancelled).

Claim 5 (Currently amended) The constant temperature distilling process as claimed in claim [[4]] 1, further comprising the steps of causing said degassed solution and said hot circulating solution to continuously flow into and out of said evaporating vessel and said liquid-gas interface, respectively, for said evaporating vessel to continuously produce vapors; opening said flow regulating valve when said evaporating vessel reaches said saturated vapor pressure at said vacuum distilling temperature, in order to allow said vapors produced by said evaporating

PAGE 5/14 * RCVD AT 3/10/2006 7:23:46 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/4 * DNIS:2738300 * CSID:410 461 3067 * DURATION (mm-ss):03-10

vessel to flow into said condenser and thereby maintaining said evaporating vessel at a stable saturated vapor pressure; and regulating said flow regulating valve to decrease a flow rate of said vapors being discharged when said degassed solution or said hot circulating solution providing evaporation heat has a flow-out temperature lower than said vacuum distilling temperature, or regulating said flow regulating valve to increase a flow rate of said vapors being discharged when said degassed solution or said hot circulating solution providing evaporation heat has a flow-out temperature higher than said vacuum distilling temperature.

Claim 6 (Original) The constant temperature distilling process as claimed in claim 5, wherein said equilibrium thermal cycling between evaporation and condensation is obtained by keeping said hot circulating solution providing evaporation heat at a temperature higher than that of said hot circulating solution recovering evaporation heat, so that said evaporating vessel has a working temperature higher than that of said condenser.

PAGE 6/14 * RCVD AT 3/10/2006 7:23:46 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/4 * DNIS:2738300 * CSID:410 461 3067 * DURATION (mm-ss):03-10

Claim 7 (Currently amended) The constant temperature distilling process as claimed in claim [[4]] 1, wherein said drain-to-vacuum process is implemented only to partially vacuumize said evaporating vessel when said degassed liquid used in said drain-to-vacuum process is the same as said degassed solution.

Claim 8 (Original) The constant temperature distilling process as claimed in claim 5, further comprising the step of implementing said drain-to-vacuum process using said degassed solution for a second time to set said constant temperature distillation unit for vacuum distillation or vacuum cooling to the initial state and thereby resume said unit to a desired degree of vacuum when air remained in said degassed solution continuously accumulates in said conduits, said evaporating vessel, and said condenser, through which said degassed solution, said vapors, or said condensed liquid flows, to produce a pressure high enough to affect said vacuum distilling temperature set for said degassed solution.

Claim 9 (Currently amended) A multi-stage vacuum distilling process for solution separation, comprising the steps of providing a tower-like multi-stage vacuum distilling system; setting said multi-stage vacuum distilling system to an initial state thereof; performing a constant temperature distilling process, transferring of solutions, and recycling of a hot circulating solution to separate said solution and recover most part of heat energy for use repeatedly; and setting a

PAGE 7/14 * RCVD AT 3/10/2006 7:23:46 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/4 * DNIS:2738300 * CSID:410 461 3067 * DURATION (mm-ss):03-10

vacuum distilling temperature for each stage of said multi-stage vacuum distilling system according to a temperature gradient of said hot circulating solution, so that said solution separation is achieved in the form of multi-stage vacuum distillation; wherein both said vacuum distilling temperature and a saturated vapor pressure corresponding thereto decrease from upper to lower stages in said multi-stage vacuum distilling system, allowing expanded ranges of usable vacuum distilling temperature and pressure as well as an increased number of vacuum distilling stages and more of said solution separable with one unit of energy; [[.]]

said multi-stage vacuum distilling system including fore-treatment equipment including heaters separately for heating a degassed solution and said hot circulating solution to a set temperature; a plurality of constant temperature distillation units for vacuum distillation sequentially stacked one over another into a tower-like structure, in which a first stage, or the highest stage, is stacked over a next highest stage, and in-flow conduits of one said constant temperature distillation unit at a lower stage are connected at a distal end to corresponding out-flow conduits of one said constant temperature distillation unit at an upper stage; and post-treatment equipment including vacuum vessels separately for collecting condensate and concentrated solution, a first heat exchanger for lowering a temperature of said hot circulating solution discharged at the last stage, a second heat exchanger for keeping said vacuum vessel for collecting said condensate at a set temperature, a common lower vessel and parts thereof for producing a vacuum

PAGE 8/14 * RCVD AT 3/10/2006 7:23:46 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/4 * DNIS:2738300 * CSID:410 461 3067 * DURATION (mm-ss):03-10

in said constant temperature distillation units for vacuum distillation, and a circulation pump for said hot circulating solution.

Claim 10 (Cancelled).

Claim 11 (Currently amended) The multi-stage vacuum distilling process for solution separation as claimed in claim [[10]] 9, wherein said step of setting said multi-stage vacuum distilling system to an initial state thereof is performed by sequentially setting said constant temperature distillation units for vacuum distillation to their initial state one by one from lower to upper stages; and wherein in said step of setting a vacuum distilling temperature for each stage of said multi-stage vacuum distilling system according to a temperature gradient of said hot circulating solution, said temperatures set for said multiple stages of said vacuum distilling system decrease from upper to lower stages, so that a saturated vapor pressure at the temperature set for each vacuum distillation stage decreases from upper to lower stages.

Claim 12 (Currently amended) The multi-stage vacuum distilling process for solution separation as claimed in claim [[10]] 9, wherein said step of transferring solutions further includes the steps of causing said degassed solution heated to a set temperature to continuously flow into said evaporating vessel at

PAGE 9/14 * RCVD AT 3/10/2006 7:23:46 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/4 * DNIS:2738300 * CSID:410 461 3067 * DURATION (mm-ss):03-10

each stage from upper to lower stages at a predetermined flow rate; allowing said degassed solution to evaporate at each stage, so that said degassed solution has a concentration gradually increases from upper to lower stages or forms crystalline precipitate therein; collecting said concentrated solution discharged at the last stage with said vacuum vessel; subjecting said collected concentrated solution to further solute concentration using vacuum freezing and drying; filtering off any crystalline precipitate before said degassed solution flows into said evaporating vessel at the next lower stage, if there is crystalline precipitate in said evaporating vessel; and collecting said crystalline with a vacuum vessel.

Claim 13 (Currently amended) The multi-stage vacuum distilling process for solution separation as claimed in claim [[10]] 9, wherein said step of recycling a hot circulating solution further includes the steps of causing said hot circulating solution heated to a set temperature to continuously flow into and out of a liquid-gas interface at each stage from upper to lower stages at a constant flow rate to provide said degassed solution with required evaporation heat, so that the temperature of said hot circulating solution decreases from upper to lower stages; using said first heat exchanger to lower the temperature of said hot circulating solution discharged at the last stage; and using said circulation pump to cause said hot circulating solution to continuously flow into and out of a condenser at each stage from lower to upper stages to absorb evaporation heat and thereby condense

PAGE 10/14 * RCVD AT 3/10/2006 7:23:46 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/4 * DNIS:2738300 * CSID:410 461 3067 * DURATION (mm-ss):03-10

produced vapors to condensate, so that the temperature of said hot circulating solution increases from lower to upper stages; and allowing said hot circulating solution to flow back to said heater for heating said circulating solution.

Claim 14 (Original) The multi-stage vacuum distilling process for solution separation as claimed in claim 9, wherein said temperature gradient of said hot circulating solution is set according to a liquid-gas equilibrium curve of said degassed solution and then used to set the vacuum distilling temperature at each stage of vacuum distillation, enabling the forming of non-overlapped temperature ranges for different stages, and a trapezoidal temperature curve showing said temperature gradient of said hot circulating solution flowing through each vacuum distilling stage.

Claims 15 - 21 (Cancelled).

PAGE 11/14 * RCVD AT 3/10/2006 7:23:46 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-6/4 * DNIS:2738300 * CSID:410 461 3067 * DURATION (mm-ss):03-10